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THE INFLUENCE OF GEOGRAPHIC FACTORS UPON THE ECONOMIC LIFE OF SWITZERLAND

by

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TOPICAL OUTLINE

INTRODUCTION

Switzerland is one of the small countries of Europe situated largely in the mountain fastness of the heart of western Europe. Yet in spite of its small size, Switzerland has achieved a wide renown and a fame and distinction out of all proportions to its relatively slight dimensions.

Switzerland is justly famous for her natural beauty, her numerous scenic attractions and her hospitality to tourists. That she has developed tourism to a point of economic importance is freely and frankly admitted. But Switzerland has achieved widespread economic development in numerous other directions. Her manufactured goods have found a world market and have given Switzerland a high place in certain specialized products. The exacting standards of Swiss workmanship and the character and nature of Swiss precision industry and research have attracted a great deal of attention and admiration from both its larger and wealthier neighbors in Europe as well as from many nations in other parts of the world. Swiss ingenuity and resourcefulness have become almost proverbial.

The purpose of the present thesis is to relate geographic factors to the study of Swiss economic life. Its purpose is not merely to measure Swiss production simply by statistics or graphs, or to evaluate import and export figures in terms of trade agreements and foreign commerce. However interesting the material of such surveys might be the intention here is to

study the natural environment of Switzerland -- the country's physiographic features, its climate, its soils and natural vegetation, its natural resources, the hydrographic factor and the importance of its central position -- and to attempt to relate all these factors to an understanding of Switzerland's economic development.

Modern geography is basically a study of relationships and the present-day geographic scholar is interested in the ways a given natural environment tends to limit man's activities,- if in some instances it does not even determine them. Man, on the other hand, is not conceived as a mere automaton, a slave to purely deterministic forces. Man acts within the framework of his natural environment. As his civilization develops he meets the ever-more-complex problems imposed by his surroundings and does something about these problems. In other words man modifies his natural environment. In the light of such a geographic concept there should be few countries more interesting to study than Switzerland.

Switzerland has not been too kindly endowed by nature except perhaps in grandiose, imposing scenery. Nature certainly has granted her very little natural wealth other than water power. Yet in spite of these very serious limitations Switzerland has achieved a high standard of living for her inhabitants at home and a definite economic pre-eminence in the world market abroad. This achievement is due in no small measure to Swiss ingenuity and resourcefulness and to the ceaseless effort

of the Swiss people by taking a geographically inhospitable environment and by making every effort to use it as advantageously as possible. To show to what degree this natural environment has hindered, limited, possibly determined and at times helped in the achievement of the balanced, vigorous economic life which is characteristic of Switzerland is the fundamental purpose of the present thesis.

Chapter I

LOCATION - SIZE - PHYSIOGRAPHIC FEATURES

Switzerland is a small land situated in the heart of western Europe or perhaps more accurately as Früh, the eminent Swiss geographer, states it "am Südrande Mittel-europas" - "towards the southern margin of middle Europe."[1] In area Switzerland extends from 45°49'2" N. latitude to 47°48'32" N. latitude and from 5°57'26" to 10°29'40" E. longitude, a total area of 41,294 km^2 or 15,940 sq. miles. This area may roughly be compared to the combined areas of Massachusetts, Rhode Island and Connecticut with about one-fourth of New Hampshire added to round out the figure; about twice the area of Massachusetts if that state is considered alone. At the point of its greatest length from south-west to north-east the maximum distance is about 225 miles while in breadth from north to south the point of maximum extent is 136 miles . By modern transportation it is thus possible to cross the land in any direction in the matter of only a few hours.

In all, Switzerland's borders measure a total of 1854.5 km. Though relatively small in size Switzerland is completely surrounded by several larger and potentially powerful neighbors. On the north Switzerland is flanked by Germany for 343.3 km of this total while on the west France forms the common border for 573.3 km. Italy and Switzerland have an irregular common

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(1) Früh, Geographie der Schweiz, Vol. I, p. 1.

boundary to the south and south-east for 733.2 km., and for 204.7 km. the eastern boundary is between Austria and the small principality of Liechtenstein. The full significance of this important factor of central position will be brought out in a detailed discussion in Chapter V. Here perhaps it will suffice to state that the element of position has been an important factor in the political life of Switzerland, especially in the field of foreign relations and particularly in the building up and in the maintenance of trade routes through that country.

Swiss geographers are accustomed to designate their country as a "Binnenstaat" - an inland, landlocked state. A glance at a map of the central part of western Europe will show the truth of Switzerland's landlocked central position and will also demonstrate the peculiar irregularities of her borders. In the north-east Lake Constance (Bodensee) forms something of a natural boundary between Germany and Switzerland for a distance of about 70 km. With the exception of the canton of Schaffhausen which projects as an enclave northward into Germany the river Rhine forms the boundary in a general east-west direction between the two countries until one reaches the city of Basel where again a small bit of territory is Swiss to the east of the Rhine. At Basel the French-Swiss border begins. For a time this boundary runs generally westward to the north-west tip of the canton of Berne. Then it dips in a north-east south-west direction following first the river Doubs and then the crests of the folded Jura mountains until it reaches the

area just south-west of Geneva and Lac Léman. At this point the boundary again swings east and then north-east to include within Switzerland the area of the city of Geneva and its environs. Lac Léman itself forms the border between France and Switzerland for some 55 kms. but before one reaches the western part of the lake the French-Swiss border dips south-eastward following the crests of some of the Alpine peaks. Near Mt. Dolent the Italian-Swiss border begins, this too following largely the crests of certain Alpine peaks. The Italian-Swiss border continues generally eastward from the St. Bernard pass through the Matterhorn to the Monte Rosa Massif. From this point the remainder of the Italian-Swiss frontier is highly irregular. For a time it runs north-east in the direction of the St. Gotthard only to dip south-east again at the St. Giacomo pass, to and through the north-eastern arm of Lake Maggiore, on south-east to include most but not all of Lake Lugano to the Italian-Swiss border station of Chiasso. Here the Italian-Swiss border is again resumed. For a time it runs almost directly northward, then east and north-east in irregular fashion to the point where the Austrian-Swiss boundary begins. The latter forms the north-eastern border of Switzerland except for a distance where Liechtenstein borders Switzerland directly. It is clear from the preceding discussion that Switzerland has highly irregular boundaries shared with several neighbors and furthermore that Switzerland's boundaries can not always be considered as being "natural" except where the

borders are formed by Lakes Constance and Geneva, by the rivers Rhine and Doubs, and by occasional mountain crests.

From the standpoint of topography Switzerland can be divided into three major regions. In the north-western part of the country is an area of rolling, folded mountains - the region of the Jura which comprises about 12% of the total area of Switzerland. Geologically and geographically speaking this area is an extension eastward of a similar area in France and this proximity and contact with France as well as the nature of the soils and the contour of the land give this area its distinct industries and types of agriculture. (See Chapters III and IV.) To the south-east of the Jura region is an area designated by Swiss geographers as the "Mittelland" -- the middleland or plateau section. This region comprising about 30% of Switzerland's total area is an area of relatively level but occasionally gently undulating plains country which extends in a general north-east south-west direction from Schaffhausen, Constance and Winterthur down through Zürich and Berne to Geneva. This area is the economic heart of Switzerland for here are concentrated her major industries, her most important cities and her most intense and productive agriculture. (Again see Chapters III and IV for a fuller development.) At the southern margin of the middle-plateau area just described the Alps arise abruptly. This area of geologically complex mountains shows violent crustal movements and comprises the remaining 58% of the country. This latter section is the area

of high Alpine peaks which raise their summits to form the "roof of Europe." This is the area of intermontane valleys with small, picturesque villages, of somewhat isolated mountain peoples, of waterfalls, of glaciers and glacial lakes, of the "eternal snows," of the Eidelweiss and the alpine flora. This is the Switzerland of story and legend and romance. In short to many people this is Switzerland. This mountainous core is largely the Switzerland of the tourist and of the foreign visitor and this is indeed the Switzerland which finds its wealth and support mainly from tourism and the yearly influx of travelers who come to enjoy the natural beauties which this area affords.

A. The Mountains As Barriers

Historically mountains have generally had a tendency to act as barriers by at least partially isolating the people who dwell within their shadows from outside influences. This often makes for an inherent conservatism in the folkways and manners of mountain peoples and for the retention of certain customs which might otherwise have disappeared. On the other hand it has been noted again and again that mountain societies often show great personal independence both as a local communal unit and individually. There is developed a spirit of personal liberty and an attitude almost of defiance, engendered it is thought (at least partially) by the self-reliance and self-dependence necessitated by the very nature of life itself with-

in a mountain environment. Naturally too the mountains are physical obstacles in the creation of an effective transportation system and in the maintenance of unhampered intercourse with the outside world.

All the above noted traits found within the human geography of a mountain environment can well be observed in Switzerland, to a degree within the Jura area, but more especially and predominantly in that area designated as the Alpine section.

To begin with it was the mountainous forest cantons of Uri, Schwyz and Unterwalden which first banded together on August 1, 1291 in defiance of the Hapsburgs. It is not unreasonable to believe that it was the spirit of liberty keenly felt by these mountain cantons which prompted this original act of defiance and kept alive a desire for freedom and independence through the years. Geography alone may not be sufficient to account for the complete historical development of the liberty-loving Swiss, but certainly the strong spirit of freedom and liberty engendered and developed by the mountain environment must ever be considered as a significant factor in the growth of the political life of Switzerland.

In their social and institutional life the Swiss too show some of the effects of the tendency for mountain societies to develop along individualistic lines. Throughout most of Switzerland and especially in the mountain cantons local patriotism is strongly felt and expressed. The Canton, a portion of

a canton, or even a local valley is the strong object of Swiss patriotic affection. For all this the Swiss mountain peasant is no less loyal in his feeling for the national state. It is predominantly local feeling, local pride and a vital concern in local politics, however, which are the core of his daily living.

Local customs too are carefully maintained in the more mountainous areas and in the valleys between. Differences of architecture, dress and dialects for example are clearly noted within a relatively small area. Visitors to Switzerland never fail to notice how the peasant of Appenzell differs fundamentally even in his attitude and outlook on life as well as in dress and speech from a peasant of canton Uri or Zug. The mountains as barriers have indeed made for distinct individual societies within the framework of the larger national state.

Economically speaking the mountains too have acted importantly as stubborn barriers. Some areas have been cut off largely from the main routes of travel. In all instances the mountains have made for difficulty of access to and from the highland areas. Naturally commercial development was inevitably slow and difficult if possible at all. This economic isolationism was well-night complete in many communities especially when the rigors of winter set in. At such times many such communities found themselves practically isolated from the rest of the world.

Such communities often turned to the development of handicrafts and weaving to pass the long winter days and nights

and possibly to add a bit to their meager livelihood by selling such products made in the home to strangers or visitors during the summer months. The bases for not a few industries such as the weaving of certain textiles, the making of laces, wood-carving and even of watchmaking in the Jura area can be fundamentally attributed originally to the geographic fact of mountain isolationism.

Today the situation described above has been considerably altered. The Swiss National Railways and the Postal Motor Coach Services now penetrate almost everywhere within the confines of the country. Even the more remote areas are connected by excellent motor coach or train service to the cities of the Swiss plateau and to the outside world. There are few valleys or even mountain villages which today can consider themselves truly "isolated" and the problems of the mountain societies outlined above are becoming less and less serious or pronounced. Nevertheless something of the spirit of isolationism within the fastness of the mountains still exists today and economically considered, the mountainous areas of Switzerland continue to present some difficult problems. These are further discussed in conjunction with soils (Chapter III) and natural resources (Chapter IV). The mountains economically speaking are in all events a poor environment and aside from the tourist trade and water-power developments do not add too significantly to the Swiss economic scene.

B. The Mountains as Basis of the Tourist Industry

Towards the end of the eighteenth century the Swiss began to realize that they had a positive economic asset in their mountains. Previous to that time the Alpine areas appear for the most part either to have been despised or regarded as a high upland area where transportation was difficult and where life was harsh and ever subject to the wild caprices of nature. Towards the end of the eighteenth century, however, and coinciding with the rise of Romanticism in art and literature the Swiss themselves as well as numerous foreign visitors began to find great beauty in the wilder aspects of nature -- in the high Alpine passes, in the glacial lakes, in the sunsets mirrored on Alpine snows, in the strength and immensity of the high, jagged Alpine peaks. Many poets and philosophers began to extol this more rugged sort of beauty in their writings. Albrecht von Haller, a Swiss poet, stirred his own countrymen to a new appreciation of their homeland by his poem The Alps. Jean Jacques Rousseau and Mme de Stael among others preached the gospel of a romanticized "return to nature" to the French and greatly lauded the Swiss mountains and the simple natural life found there. Goethe visited Switzerland three times and wrote enthusiastically about that country. Schiller too praised Switzerland and the Swiss to the Germans. The British also began to note the poetic charms of Switzerland and likewise "discovered" the country as a splendid holiday land which particularly beckoned the sportsman and the mountain climber.

Since then and for well over a century and a half the Swiss have recognized the Alps to be the basis of one of their major industries, tourism, and they have done all they can to develop systematically and intelligently this important side of their economic life.

Today there are some 7378 hotels in Switzerland. Some of these to be sure are found in the cities, but a very large number of the total cater to those who seek a holiday in the mountain resorts. "The Swiss Hotel Association" maintains extremely high standards of clealiness and service regardless of whether the hotel is of a deluxe type or a simple pension and the personnel of all hostelries are devoted to making the visitor's stay in Switzerland a pleasant one.

Closely associated with persons who find their employment directly in the hotels and hotel trade are other personnel such as tourist agents, guides, mountaineers, ski instructors, etc. whose jobs might also be said to depend quite directly upon the mountains and tourism for their very existence.

Switzerland maintains well-established tourist information centers both within the country and abroad and by so doing endeavor to attract many to visit the country and to enjoy its hospitality. Such people engaged in tourist propaganda (of a very high order) naturally owe their jobs to the tourist trade. It is obvious, too, that the many guides who are found in the mountain areas especially depend upon the yearly influx of tourists for their livelihood. At such well-known mountain

resorts as Zermatt, Saas-Fee or Wengen or almost anywhere in Switzerland for that matter such guides are available for general sightseeing, for a casual hike or for the most rigorous sort of mountain climbing if the taste should dictate. In winter many mountain villages especially those in the Bernese Oberland and in the easternmost canton of Grisons have developed into prominent winter-sports centers. These are areas where the mountain slopes or mountain lakes plus the fairly rigorous winter climate give the correct topographic and climatic factors for such a development. At such centers as Interlachen and St. Moritz tourists in large numbers continue to be attracted to Switzerland during the winter for sports events and for a whirl of social activity at a time which otherwise would be something of a dead season.

It is obvious that in addition to those who depend directly upon tourism for their livelihood there are many who derive appreciable results indirectly from the tourist influx to Switzerland. The Swiss National Railroads, the postal motor service, the privately-owned mountain railroads all naturally find increased revenue from the visitors. So in many instances do the shop-keepers and tradesmen in numerous Swiss towns and villages who at least considerably augment their income by services of one kind or another.

This is not to state that Switzerland depends solely or even primarily upon tourism for its economic existence. Such a statement would not bear up under the facts for Switzerland

is one of the most highly industrialized countries in the world and derives revenue from many other sources. Tourism, however, does figure in as a welcome addition in helping significantly in rounding out the national budget with a favorable balance of trade for the Swiss, and any year with a considerable tourist slump is likely to be a year which brings along with it some economic difficulties. The mountains then do have a real economic value!

In a recent book The Swiss Without Halos the author, J. C. Herold, in attempting to correct certain common misinterpretations about Switzerland, states the following:

> Of course, the tourist trade of Switzerland is by no means the most important national industry. In fact, it employes but 3.5% of the working population and provides but a minor fraction of the national income; just how much it is impossible to calculate, for obvious reasons. (2)

The above figure would appear to cover the hotel population only for the reliable Statistisches Jahrbuch gives the figure 3.5% for the hotel industry alone.(3) As has been pointed out there are obviously many others who directly or indirectly profit from the tourist trade. It is difficult if not impossible though to arrive at an all-inclusive figure and any estimation would be but a guess. Recently, however, an American reporting about present-day conditions in Switzerland hazards a suggestion that about 10% of the national income is

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(2) Herold, The Swiss Without Halos, p. 212.

(3) Statistisches Jahrbuch der Schweiz, pp. 55 and 76.

derived from the tourist trade.[4] This would seem to be a reasonable sum. The same writer cautions on an overemphasis here though much as does Mr. Herold. "Scenery is am impressive thing in Switzerland," he writes. "It accounts for the halo or much of it. It is an important thing. But not the only thing. This requires emphasis."[5]

It is with Mr. Cunningham's emphasis that we might conclude this chapter. From the physiographic standpoint the 58% of the country which comprises the highly irregular Alpine area is one of complex mountains geologically speaking which in the past have made for isolationism, seclusion and sectionalism. Today it is precisely this area which makes Switzerland "the playground of Europe." This latter activity is intimately and closely connected with the geographic factors of location and physiographic features. Switzerland can attract people from the numerous countries which lie about her but more importantly she has the scenery and natural beauty with which to attract them. Switzerland thus has conscientiously exploited tourism and has made it a valuable part of her economic life. It must be repeated, however, that tourism is only one part of her total economic development. Switzerland is far from living by tourism alone.

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(4) W. W. Cunningham, "Watches Time Swiss Industry", Christian Science Monitor Magazine Section, 25 June 1949, p. 5.

(5) Ibid., p. 5.

Chapter II

THE CLIMATIC FACTOR IN SWISS ECONOMIC LIFE

In referring to the climate of their country the Swiss are accustomed to state, not without some humor, that they are all types from a "pseudo" Mediterranean variety to that of the polar regions. It is somewhat surprising to many, at least at first sight, to realize that such a small land which extends through only 2° of latitude should have such wide variations from the sub-tropical to the semi-arctic. Of course upon further reflection it becomes obvious that climatic contrasts in Switzerland are not due primarily to surface areal differences of a north-south or east-west variety but rather to vertical differences of altitude and to degrees of exposure.

Basically the climate of Switzerland must be regarded as a transition type between the Humid Continental and the Marine West Coast types. Some of the west winds bring their moisture inland as far as the slopes of the Juras and the Alps. Even in western Switzerland, however, there is a change noted from the milder Marine West Coast climate to the more rugged and severe Humid Continental type. Add to this an elevation of several thousand feet or more and the severity of the climate is naturally increased. Thus in the Jura area there is abundant precipitation which in the winter takes the form of snow. In general this Jura area with some of its valley bottoms at

around 3000 ft. and the mountain crests averaging 5000 ft. has long, harsh winters and summers which are much less mild than the pure marine west coast climate of western Europe.

The Swiss plateau averages about 1500 ft. above sea level and is thus considerably lower than either the Jura area or the Alpine sections which border it. This makes for slightly more moderate winters than either in the Jura or in the Alps and for slightly warmer but rainier summers. In place of snow which falls so abundantly in the Juras and in the Alps during the winter, the "Mittelland" or plateau is likely to receive some of its precipitation as rain. The pleateau also experiences much fog as a result of air drainage. Thus the cities of the plateau are often completely covered by a dense fog for days on end during the winter months whereas during the same period the mountains above certain elevations enjoy brisk, but sunny weather.

The Alpine region is an area of high relief and the vertical gradient is important in determining temperatures. At Davos (5121 ft. altitude) in the canton of Graubünden the average temperature for January is 18.7°F.: for July 53.8°F. The Total annual precipitation there is 35.7 inches. At Säntis in Appenzell the Swiss have maintained a mountain meteorological station at an altitude of 8202 ft. above sea level. At Säntis the January average is 16.2°F.: that for July 41.0°F. while the total annual precipitation is 95.7 inches. These figures reveal something of the nature of the climate of the Alpine

area and show clearly the influence of altitude. In general the snowline is reached between 8,000 to 10,000 ft., the difference in figure depending partially upon exposure.

The "pseudo" Mediterranean climate already alluded to occurs in a relatively small area on the south-eastern part of the canton of Ticino in the general vicinity of Lugano and Locarno. Here the altitude is generally low. In fact the lowest altitude in Switzerland, 663 ft. above sea level, is found along the shores of Lake Maggiore. Due to the phenomenon of temperature inversion and because it is protected from the colder winds of the north by a back-drop of mountains this so-called Italian lake area enjoys a milder climate than do the plains of Italy which lie to the south. In fact the climate permits a sub-tropic type of vegetation and gives this area a distinctly "Mediterranean" aspect.

From the standpoint of economic geography the climatic factor has a direct bearing upon several aspects of Swiss life. First of all some students such as Ellsworth Huntington and others point out the general excellent quality of the climate of Switzerland and attribute Swiss initiative, vitality and skill in no small measure to be due to the challenging nature of Swiss climate.[1] There is probably some truth in this contention. Swiss climate does come close to that which has

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[1] Huntington and Gregory, The Geography of Europe, p. 27.

been described as the best type for maximum human activity and productivity. That Switzerland for the most part is so endowed with an energetic, stimulating climate is certainly an additional geographic factor for important consideration in evaluating that country's economic life.

Secondly the climatic factor enters directly in any discussion of health or climatic resorts. These in turn are somewhat related to tourism already discussed with specific reference to Alpine Switzerland.

In the Swiss portion of the "Italian Lake" area around Lugano and Locarno the climatic element alone has been largely responsible for the development of this area as a center of tourism. The mild climate of southern Ticino permits the growing of palms, magnolias, oleanders, agave plants, lemon trees and other sub-tropical vegetation and gives Switzerland a kind of riviera. It is certainly the warm, sunny climate of the region that makes this area another spot which delights the visitor - this time largely and basically because of the climatic factor involved.

The climatic factor, too, is responsible primarily for the establishment, growth and continued fame of such celebrated health centers as Davos, Arosa and Leysin. It is true that these and similar centers are found in the mountains at altitudes averaging between four and five thousand feet above sea level, but in this case it is much less spectacular scenery that counts, but rather sunny, sheltered spots where patients

with pulmonary disorders can gain the benefits of the sunshine in addition to enjoying the salubrious pure dry mountain air. The sanatoria and nursing homes of Leysin and Davos alone are visited by thousands of Europeans each year in quest of renewed health and well-being and it is the climatic factor above all which are responsible for attracting them there.

The climatic factor nevertheless cannot always be so neatly isolated. Certainly climate is important in the limitations it puts upon plant growth and yet the latter also is closely tied up with soils. In any consideration of Swiss agriculture this climatic factor is no less important. In fact in mountain areas climate sets an altitude limit for the growth of certain crops and types of natural vegetation and from this standpoint one can speak of a definite form of climatic control. But agriculture too depends very directly upon another primary factor, that of soils, and it is in this relationship that Swiss agriculture will be more extensively discussed in Chapter III.

Chapter III

SOILS AND THE NATURE OF SWISS AGRICULTURE

A general survey of soils conditions in Switzerland reveals that with a very few local exceptions the soils of that country are poor indeed. In fact one American student reporting for the American Policy Association states that according to the high standards of the United States Department of Agriculture "most of Switzerland's land is unfit for agricultural use."[1] This paucity of good soil in Switzerland means, of course, that Swiss agriculture is maintained at the expense of great labor and travail. Only 18% of the total land area of the country is arable and much of this is worked under conditions which are exasperatingly difficult.

The best soils of Switzerland are to be found on the Swiss plateau, but even here the soils are far from ideal for agriculture. To begin with the plateau area was glaciated within recent geological history and the present soils then are youthful in character, derived largely from glacial drift and the post-glacial weathering of bed-rock. In many instances the soils have not as yet even achieved fully developed profiles. At some points to be sure some extra glacial or loess deposits or some added humus give an area of greater local

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(1) Hediger, "Switzerland In Wartime," Foreign Policy Reports, Vol. 18, No. 20, Jan. 1, 1943, p. 264.

fertility. Nevertheless on the whole the soils of the plateau require intensive cultivation and the addition of considerable amounts of fertilizers to give the desired productivity.

Nevertheless in spite of the limitations outlined, the Swiss plateau is the scene of great agricultural activity and is the economic heart of the country agriculturally speaking. Here on the plateau are grown as many staple crops as conditions will permit. Wheat, rye, oats and maize are among the crops importantly grown. Potatoes and various types of vegetables are also raised in quantity. Along the lower slopes of protected areas especially near the Swiss lakes are found considerable areas devoted to orchards and vineyards. The latter figure especially prominently around Lake Geneva. On the plateau, too, contrary to the general impression, there is much more important dairy activity. In fact the greatest number of dairy cattle in Switzerland are concentrated here. All in all the plateau contributes significantly to the production of a major portion of vitally-needed food stuffs for home consumption. The dairy industry by making and exporting quality cheese, condensed milk and fine chocolate products with a milk base adds these items to Swiss products which find a wide market abroad.

The Jura area is much less significant agriculturally. Its soils, too, are glaciated, thin and immature and furthermore rest on a calcareous, permeable sub-soil. This factor plus the upland character of the topography and the harsher

climate means that the greater portion of the Jura is retained as a forested area with beech trees at lower elevations and pines and firs predominating at higher levels. Some areas have been cleared for pasture land but little land is cultivated. Cattle raising and cheese are this area's dominant agricultural contributions. At a few protected spots along the Lakes of Biel and Neuchâtel there are some vineyards and orchards but by and large the fame of the Jura is not derived from its agriculture.

The soils of the Alpine section are in no way better from those of the Jura. The Alpine slopes and valley bottoms have been glaciated so that soil, where it exists, lies thin and poor. Yet every bit of soil is used wherever and whenever possible for soil in the Alpine highlands becomes a much sought for and treasured item. Occasionally a local Alpine valley basin will have a richer accumulation of grey-brown podzol soils brought down and deposited as sediments by mountain streams or water courses. For the most part, however, soils in the Alps are sparse in quantity and poor in quality, all of which makes for a difficult sort of agriculture.

In spite of the difficulties involved Swiss peasants attempt to eke out a rather precarious existence from their mountain environment. In the valley bottoms some vegetables, fruits and grains are raised. On the mountain slopes where the soil is sufficient grains are likewise grown as well as

as well as quantities of hay for animal fodder. Sometimes this sort of agriculture continues up to heights of 5000 to 7000 feet. Peasants in the Bernese Oberland or in Graubünden have been known to cut and dry grass on slopes considered too steep even as pasturage for goats. Every bit of precious soils must be utilized to provide human food and above all as pasturage for cattle and goats, for in this area it is largely animal husbandry which furnishes the basic commercial articles of cheese and milk-products which are the staple articles of exchange with the outside world.

Transhumance is an interesting sort of human adjustment to economic conditions within a mountain environment. Professor Franklin C. Erickson has made a detailed study of transhumance in Schächenthal, one of the side valleys of the canton of Uri, and in a published article gives us some insight into this special form of human activity.(2) Precise details may differ from valley to valley but in general, transhumance might be defined as a vertical migration of people with their flocks in an effort to seek out and utilize the mountain pastures on a communal basis. If the valley basins supplied enough fodder this annual movement up the mountains would not be required. This, however, is not the case. The pasture on the mountain slopes must be utilized. Thus in spring as soon as the lower slopes are free from snow the men and boys of the community

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(2) Erickson, "Transhumance in the Land Economy of Schachenthal," Economic Geography, XIV, Jan. 1938, pp. 38-46.

start up the mountains with all the cattle of the village. They remain at the first level where grass is found until the pasturage has been cleared and then work their way up to the next level. Thus in something of a step-wise fashion they proceed on upwards until sometimes they come close to the snow-line. In general the high-point of their trek is reached sometime around mid-July. When the highest Alpine meadow has been reached and cleared by the animals the descent begins, again in a step-wise manner until finally the village in the valley is reached sometime in the early fall. In the meantime the women, the older men and the very young have been at work tending the fields close to home and bringing in food and fodder for the long winter ahead. Transhumance is a communal effort to meet sheer economic necessity in the harsh natural environment of Alpine Europe and is of special interest in understanding the human geography of much of mountainous Switzerland.

In a few instances due to exceptional circumstances Switzerland shows a couple of favored fertile spots. One such area is found along the shores of Lake Geneva between Lausanne and Montreaux. Here the climate is milder because of the protective nature of the surrounding mountains. The "bise", that cold breath from the north, never penetrates. The soil, too, formed largely from a former lake-bottom with alluvium from the Rhone valley gives this area a unique quality and the Swiss perhaps rightly call it a "heaven-blessed corner". This area is especially devoted to vineyards and fruit trees, but it is

the former which is pre-eminent. Here in the canton of Vaud is the center of Swiss wine production some of which finds an international market.

Another area of exceptional interest and likewise one of the favored spots of Switzerland is the valley of the Valais. This actually is a transverse valley formed by the Rhone as it makes its way westward towards the Lake of Geneva. Due to the alluvium which the Rhone brings with it this valley is one of the most fertile in Switzerland. Peculiarly enough, however, this is one of the few spots in Switzerland which does not get enough natural precipitation due to high mountain ranges to the north and south. Irrigation is practiced and has been practiced here for hundreds of years to overcome this deficiency. Water is brought down from the heights by troughs or or "bisses" as they are locally known. The valley of Valais is noted for its production of fruits such as peaches, pears, strawberries, apples and apricots and for a specialized crop famed throughout Switzerland - asparagus. There are also some vineyards on the slopes bordering the plain.

On the whole, however, the above sections are exceptional in their productivity and for the most part Swiss agriculture is no easy affair. Agriculture is conditioned by the factors of soil and climate. In Switzerland the latter is generally favorable for most types of middle-latitude agriculture except at very high altitudes. The soils of Switzerland are much less conducive to easy productivity or large yields. Yet by dint of

ceaseless effort and great exertion the Swiss have raised their production figures in agriculture to amazing heights.

Switzerland is by no means self-sufficient in agriculture though in certain crops such as potatoes, fruits and vegetables and in dairy products she can almost supply her own needs. In grains she is notably deficient and must import wheat in some quantity. Switzerland also imports meat since most Swiss cattle are bred for dairy purposes. Even under the emergency war-time Wahlen plan with its food rationing and planned diets Switzerland could not avoid importing some foodstuffs to maintain a near-subsistence standard of living.

This latter statement in no way reflects adversely upon the Swiss nor belittles their efforts in agriculture. Actually their record of agricultural achievements is quite remarkable. From relatively poor soils they have achieved an amazing record of production in a wide diversity of crops, largely as the result of great toil and effort. Much of the food is for home consumption, but some products, especially dairy products, are processed for shipment abroad. Tasty cheese such as Emmentaler and Gruyère are widely known and enjoyed outside Switzerland. Ovaltine, Maggi soups, bouillon cubes and seasonings, Peters and Nestles milk chocolates, and condensed and powdered milk are some of the better-known food products which are exported. By so doing Switzerland is able partially at least to pay for some of the food she must import. Here again is another example of Swiss initiative at work in the attempt to

achieve a balanced economy, and in the ceaseless effort to adjust life to the harsh economic realities of a rugged geographic environment.

Chapter IV

NATURAL RESOURCES AND SWISS INDUSTRIAL DEVELOPMENT

An appraisal and evaluation of a country's natural resources, especially of its minerals and metals, is a prime geographic factor for careful study and consideration. It is upon the presence of considerable quantities of coal, iron and other primary minerals advantageously placed that modern industrial development is generally felt to depend. Certainly there is an intimate relationship between the natural wealth that a country may exploit and its industrial potential or actual development. Other things being equal a country with poor or negligible natural mineral wealth would seem to have little or no chance whatsoever to achieve any great economic success in competition with the more favorably endowed industrial nations of the world. In the light of these statements Switzerland stands as something of a unique and interesting example, perhaps even as an exception, for here is a nation which has achieved considerable industrial development almost in defiance of the poorness of its geographic background.

Switzerland has few natural resources. It is a mistake, however, to state, as some writers have insisted, that she has none. To begin with Switzerland does have sufficient stone and marble quarries to meet the needs of home consumption and some foreign demand for building materials of this type. This is true also of sand and gravel for construction purposes. Around

the town of Bex in Valais is a salt producing area which yields an average 1,000 metric tons per year. Rheinfelden in northern Switzerland also produces quantities of salt. The Rhone valley has some coal but the quality is very poor and the mines are small. These mines and a few peat beds found here and there throughout the plateau area have only slight local importance, and were worked actively only during the times of scarcity during the two World Wars. The same is true of a few small iron mines located around Herznach and Gonten. Though some iron ore has been located around the areas named the quality and quantity is so very poor as to make mining economically unprofitable. Thus to all intents and purposes coal and all ferrous and non-ferrous metals are non-existent in Switzerland and must therefore be imported.

Swizterland's only mineral resource of value is water power. The Swiss mountain streams and lakes, particularly when dammed and directed down the steep mountain slopes are capable of producing a great deal of water power. The Swiss, especially within recent decades, have been making maximum use of their "white coal" potential.

Other than those materials mentioned above Switzerland has practically no other natural resources or mineral wealth upon which to base her economic development. And yet Switzerland has become an important industrial nation. In fact "in relation to its area and population it is one of the

leading industrial (and commercial) nations of the world."[1] Forty-five percent of the Swiss are engaged directly in industry. This figure makes an interesting contrast with agriculture, the next largest occupational group, which accounts for 22% of the total working population. Switzerland's place among the European industrial nations is well-established and secure.

How has this been possible? To what may be attributed the rise and development of Switzerland's industrial power? How have the Swiss been able to create a highly industrialized state from a natural environment which would seem to preclude any such possibility? The answer would seem to lie largely in the nature of the Swiss people themselves. The Swiss have carefully and systematically developed a great number of abilities and skills which they sell through their well-made, quality-grade products. Because of the care taken in manufacturing and because of the general high quality of their goods Swiss export articles have a high value per unit bulk. In this way the Swiss can meet the costs of importing the raw materials as well as the cost of transportation of the finished product and still make sizable profits. For the Swiss at least this has proven to be sound economics, for this is the basic principle upon which Swiss industrial progress has been based.

Of course the Swiss have made maximum use of the one outstanding mineral resource which they have, that of water power.

[1] Pearcy and Fifield, World Political Geography, p. 188; chapter by Franklin C. Erickson.

Switzerland has an estimated 4 million horse power of electricity available and of this 3 million are at work. Numerous power stations are found throughout Alpine Switzerland. One of the best-known and largest in the country is the Grimsel Barrage found near the heart of the Gotthard Massif. It may well serve as an example for many others scattered throughout the Alps.

Just a few miles north-west of Gletsch was formerly a small mountain lake known as the Grimselsee. It was fed by the Aar glacier and several mountain streams, and lay in a valley-like basin surrounded by massive walls of rock except at its point of outlet. By building a dam 375 ft. high and 848 ft. long at the outlet a large basin was artificially made and the small, original lake was converted into a reservoir 3.4 miles long with a capacity of some 22,000,000,000 gallons.

The water from the Grimsel Reservoir is sent through pressure conduits down the Aar valley to the power station at Innertkirchen. The total fall is just over 4,000 ft., spread over a distance of 10 miles, with only one intermediate power station about half way along the line to regulate and control the flow. At Innertkirchen five sets of turbo-generators create electric energy which in turn is transmitted by high tension networks to further distributing points. The Innertkirchen power station alone is able to supply 360 million kwh. of electric energy per year.

The power station just mentioned is one of the large ones

of Switzerland and yet is representative of others distributed throughout the mountain areas. The bountiful supply of electricity in Switzerland means that this form of power is relatively cheap here and has widespread use. It is only the remote farm or mountain hut which is without electric power, for thousands of miles of high and low tension distributing systems link up the power stations which transmit electricity to practically all corners of the country.

An important application of electric power is found in the electrification of the Swiss railroads. Today all the main Swiss lines are electrified. In 1942 only 625 miles out of a total 3645 miles were not run by electricity, and these were mostly local lines. Electrification continued apace even during the war years and it is stated authoritatively that by 1950 all Swiss railroads will be running on electric power. The electrification of her lines permits Switzerland to have some of the fastest, cleanest, most commodious trains in the world and these in turn serve as additional boon to the tourist industry. Electrification too gives Switzerland complete freedom from outside dependence upon a foreign fuel supply.

From the industrial standpoint electricity is used with maximum effectiveness in the extraction of aluminum and other metals from the base ore by the electro-chemical process. The electrolytic process was first introduced to Switzerland some decades ago at Neuhausen (near Schaffhausen) where the power

from the falls of the Rhine could be utilized. Neuhausen still stands as one of the important aluminum producing centers of all Switzerland but recently there has been considerable further development in the Rhone valley area centering around the towns of Chippis and Martigny, both in the canton of Valais. In all cases large quantities of electric power are required. The Bauxite, of course, must be imported. In somewhat of a similar manner metallic sodium and iron alloys are manufactured electrically. Nitrogen products too are produced from the air. All these processes may differ somewhat in detail, but at the basis of the electro-chemical industry is the need for large quantities of waterpower. Switzerland's one abundant mineral resource can be used here with great effectiveness and to her economic advantage.

Interest in water power and the electricity derived therefrom has stimulated the Swiss considerably in the lines of electro-technology and particularly in the manufacturing of all sorts of electrical equipment. In fact the largest Swiss manufacturing firm of any kind is that of Brown and Boveri at Baden (near Zürich) which specializes in all kinds of electrical engineering equipment from complete power stations and generators to transmission tubes. This plant and others supply Switzerland with its needed electrical equipment, and has stimulated research and invention along these lines. Some electric products, such as dynamos, generators, electro-turbines and the like have found a foreign market largely because

of the all-round excellence of the product concerned.

Because of the great diversity of Swiss manufacturing it is impossible to describe each and every product in great detail. In spite of the great diversity mentioned, however, there is a quality which more or less characterizes them all. That quality is found in the amount of skill, in the painstaking work and in the artistry which goes into Swiss manufactured products. It is this care of manufacture which gives Swiss products a reputation for excellence and which allows the Swiss to sell a wide diversity of articles on the open market in competition with other manufacturing nations. The Swiss primarily sell their abilities and skills in articles of high value and of unqestioned excellence.

These facts are well demonstrated in the watchmaking industry. Historically this industry is reported to go back to the middle of the sixteenth century when Swiss watches were first made in and around Geneva. The industry soon spread and took root in the Jura mountains, especially because the enterprising people there found watchmaking to be a profitable secondary occupation and a way to help pass the long, harsh winters of that area. Today it is the Jura area which is the heart of the watchmaking industry and such towns as La Chaux-de-Fonds, Le Locle and St. Imier have become vital centers of the watchmaking art.

Little comment is required about the merits of the Swiss watch. It is a product known and respected the world around.

In design, in beauty and in general technical excellence the Swiss watch or clock has few rivals. In fact to date only the Swiss have been able to make watches with an automatic self-winding mechanism or watches that are truly "waterproof". Trade names such as Omega, Mido, Eterna, Rolex, Patex et Phillipe and many others testify to the fine craftsmanship of high-quality time pieces which have made the Swiss watch universally famous. Here again the Swiss are selling their skill and abilities in a much sought for item which has achieved a world market.

Closely connected with watchmaking is the jewelry industry of which Geneva tends to be the center. Swiss engravers, enamellers and goldsmiths are known for the individual excellence and artistry of their products and often add much to the artistic side of the watch industry.

The Swiss too have developed precision instruments and tools not only for home consumption but likewise for the foreign market. Carefully constructed calibrators, machine tools of a variety of sorts and adding machines are some of the better-known articles which fit into the above category. But Swiss manufacturing in this line is not necessarily limited only to smaller objects. Besides some of the bulkier type of electric equipment already mentioned the Swiss manufacture their own railroad equipment and some locomotives and cars are made for export. Other articles such as marine turbines, Diesel engines and textile machinery of a wide variety are manufactured

too both for home use and for shipment abroad. (Winterthur is the center for the manufacturing of much of this heavier equipment.) In all instances it is still Swiss creative ability at work turning out products of high value from imported raw materials.

The textile industry centering largely around St. Gall, Glarus and Zürich in northern and eastern Switzerland is also one of the country's significant industries. Originally this industry was a "home" industry with embroidery, lace making and spinning centering in the homes of north-eastern Switzerland. Today the textile industry is largely specialized and dominated by the machine. Cotton spinning and weaving, wool, silk, linen and embroidery are all variously featured. More recently the Swiss have done much work with rayon and other synthetic fibers. Directly linked up with the textile trade is the dye industry, a very important side of Swiss chemical research. The Swiss have developed fine dyes and dyeing techniques for the coloring of fibers of all types. Some of the textile industry naturally contributes to the making of certain articles for domestic consumption but other articles are destined for the export market. The latter are generally silks of exceptional quality and merit, often handsomely dyed, or embroideries and textile specialties of one sort of another such as ribbons, braids, handkerchiefs, prints for dress materials, etc. In each instance a place in the world market can be achieved only by virtue of the quality and excellence of the

product in question and by the beauty of the patterns. Here also the Swiss must strive to create a superior or more beautiful product.

A final industrial category for consideration is that of pharmaceutical products. This industry is concentrated in and around the city of Basle. The pharmaceutical industry was originally tied up with the dye industry, but has grown independently within this present century to great size and importance. Today such firms as Ciba, Geigy, La Roche, and Sandoz are well-known, and the work of Swiss pharmaceutical chemists has been acclaimed far and wide. Ciba has worked especially in the field of hormones but is also noted for the production of sulfathiazole, one of the best known and most effective sulfa drugs. Geigy is especially famous for the discovery and production of DDT while La Roche has concentrated especially on vitamin products. Sandoz is famous for aniline and alizarine dyes as well as for a variety of medicinal products. This list of Swiss pharmaceutical products could be multiplied many times over but is representative at least of some of the important work being done. The pharmaceutical industry depends largely upon the export market as less than 10% of the pharmaceutical products are sold at home. Foreign sales can be maintained only by preserving the very highest quality of Swiss pharmaceutical products and by keeping pace with the scientific advance of other countries. So far the Swiss have done very well. In 1913 the export of Swiss pharmaceuticals amounted to

7,900,000 Swiss francs: by 1946 the export figure had risen to 114,700,000 Swiss francs. Another significant group of items has been added to the growing list of Swiss export products.

The Swiss industries listed above are not complete in the sense of including all specialized types or categories of Swiss products. It would seem, however, that a representative survey has been made for the purpose of the present study. That purpose has been to show clearly that Swiss industry, whatever its particular type, rests upon the necessity of producing a superior product based upon careful planning and the execution of skilful workmanship. In a land whose geography has supplied it with only one mineral resource of any particular significance- "white coal" - the Swiss can be prodigal only in electric power. With an abundant supply of the latter they can afford to use much of it for the extraction of aluminum and of ferro-metallic products by electro-chemical processes. In all other cases the raw materials must be imported and these in turn made into products of value. Herein lies the significant economic lesson of Switzerland. From a geographic environment seemingly devoid of most possibilities for industrialization the Swiss have created an outstanding industrial country. This can hardly be due directly to any geographical factors save, perhaps, the contributing one of a stimulating climate. The explanation of the development of the Swiss industrial state must be sought elsewhere and that explanation is found in the Swiss people - in their courage, in their tenacity of purpose and in

their highly developed skills and abilities. In Switzerland the human factor has dominated and triumphed over a generally hostile environment. In Switzerland man has significantly modified his natural environment to his own purposes and advantages and has become thereby in a measure its master.

Chapter V

THE ECONOMIC PROBLEMS OF CENTRAL POSITION

Switzerland's central position as a small compact landmass in the heart of western Europe has already been alluded to in Chapter I. This geographic factor is of vital importance in the shaping of Swiss international relations and in influencing Swiss internal political life. The element of position likewise plays a definite part in the economic sphere, at times aiding the Swiss in their efforts to achieve a balanced economy and a high standard of living, and at other times (especially during periods of world crisis and war) acting as a handicap and as a strong deterrent factor.

Swiss geographers constantly refer to their country not only as a "Binnenland", a lanlocked, internal country, but also as a "Durchgangsland", a land of passage, a transit land. Economically, this transit feature dependent upon central position has proven to be important.

Within recent decades Switzerland has achieved its maximum development as a transit land, but historically considered Switzerland has always been something of a transit country. The Romans knew the Helvetians and their mountainous land and formed settlements in what is present-day Switzerland. Caesar conducted campaigns which led him over the Alpine passes and Hannibal made his famous descent over a Swiss Alpine pass to the plains of Italy. As a matter of curiosity about 50,000

people (1% of the total Swiss population) living in the mountain areas of canton Grisons today and speaking Romansh, are believed racially and liguistically to be direct descendents from Latin-speaking peoples of the Roman Empire. Some scholars believe the Romansh-speaking Swiss to be descendents of a Roman army division which may have penetrated into the mountain fastness of eastern Switzerland and remained there. Others believe that people from northern Latium under pressure from Roman armies fled into the remote mountain valleys of present-day Grisons for safety and security. In either case the influence of ancient Rome is clearly seen as extending even into some of the remoter areas of what is present-day Switzerland.

In medieval and early modern times the Alpine passes were likewise known and used. In those days they were regarded largely as barriers, but still the most direct way between Italy and the north. In late medieval times when Venice and other Italian port cities dominated the flourishing Mediterranean trade with the East important direct trade routes northward lay through the north-Italian plain, over the Alpine passes and on into Germany, France or the Low Countries. The Gotthard pass was especially important and Switzerland enjoyed for a time special protection from the Holy Roman Empire because of its control.

Within more recent times various great writers have left their impressions of travelling through the Alpine passes by stage coach. Goethe on his way to Italy passed through

Switzerland and over the passes to the south. Byron, Mme de Stael and others also found Switzerland to be on the direct route of passage between north-western Europe and the peninsula of Italy. It was largely as a transit land that Switzerland itself was first "discovered" by the literati.

In recent times Switzerland as a land of transit dates significantly from the piercing of the Alps by railroad tunnels. The first of the great tunnels through the Alps was the Gotthard. Construction was begun late in 1872 and the project took about a decade for completion. In February 1880 the full length of 9.3 miles had been pierced but it was two years more (Jan. 1, 1882) before the tunnel was open to traffic. The Gotthard route makes possible a direct route from Lucerne and Zürich (and connecting points to the north and west) to Chiasso at the Italian frontier. At Chiasso the Italian State Railways take over with routes leading on to Milan and the south. The Gotthard rail route has become one of the truly important lines of Switzerland especially for travel to the Lugano-Locarno area and also as an international line into Italy.

The second great tunnel to be pierced under the Alps was the Simplon. This tunnel proved to be an even greater engineering feat than that of the Gotthard. Work was begun in 1898 (though plans had been made as early as 1875) and by 1905 the main "gallery" was pierced. Work was completed in May 1906. A parallel tunnel was begun in 1912 but World War I interrupted the completion of this until 1922. The Simplon Tunnel

is 12.26 miles long, the longest in the world. Essentially it performs much the same function as the Gotthard tunnel by connecting western Europe with the south, but since the Simplon lies a little further to the west than does the Gotthard and because of the direct northern connections made via the Loetschberg the Simplon has become of even greater importance for international traffic than the Gotthard.

The Loetschberg tunnel was opened in 1913. For nine miles it goes under the Lötchen Pass in the Bernese Oberland and connects Thun (and Berne) with Brigue in the Rhone Valley. At Brigue the Loetschberg line joins with the Simplon line coming from the west and makes connections here for traffic to the south.

Together the Simplon-Loetschberg routes serve western and northern Europe well, connecting the thickly populated centers of the European plain with Italy and the Balkans. The famed international train the "Simplon-Orient Express" runs from Paris via Lausanne and Brigue, through the Simplon tunnel to Domodossola (the Italian frontier station), then on to Milan, Venice, Trieste, Belgrade, Bucarest, Sofia and Istanbul. One section branches off at Milan and proceeds to Genoa and Rome with some through cars going as far as Brindisi. In connection with the Loetschberg extension the Simplon-Loetschberg route is the shortest, most direct route between England, Holland, Germany, the Scandinavian countries and the Riviera, Genoa, Milan, Venice and Rome. The Simplon route direct via

Lausanne is the shortest way between the Paris basin and Italy.

The importance to Switzerland of the transit routes over the Gotthard and the Simplon-Loetschberg systems can be readily appreciated. In the first place it puts Switzerland on the main lines of traffic making travel as well as shipment of goods to and from that country direct and expedient. In other words Switzerland can be easily visited from all parts of Europe (thus aiding the tourist traffic) and commerce with Switzerland is greatly facilitated. Secondly because of the large amounts of goods carried through Switzerland on the international lines the Swiss National Railroads earn considerable revenue for their share of the haul. It has been estimated that in normal times the Gotthard line alone carried "a total of up to 20,000 metric tons a day.....when favorable economic conditions prevailed."(1) No breakdown is given as to what percentage of the total tonnage of the above-mentioned figure was international goods in transit. but it may be assumed that a reasonably high percentage would be of this character. That being the case one can realize the profit of just these transit shipments to the Swiss. In the third place the Swiss, by controlling these tunnels, have a "trump card" to play in times of international crises. The Swiss railroad tunnels (and to a lesser degree the mountain passes) so regulate the flow of goods and traffic between north-west and Europe and Italy that

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(1) Switzerland, The Traveller's Illustrated Guide, p. 165.

the control of these tunnels and passes becomes a matter of vital strategic importance when Switzerland's neighbors become involved in armed conflict.

This last-mentioned fact was dramatized to the Swiss during World War II. World War I had given Switzerland some anxious moments with regard to her neutrality and naturally upset the balance of her economy. But because much of France never fell into German hands during World War I and because of Italy's late entrance into the war Switzerland did not feel the pinch of encirclement as drastically as during the years 1939 to 1945.

In World War II, after the fall of France in 1940, Switzerland found herself surrounded by Axis controlled or Axis dominated territory. Yet except for a few brief moments of defeatism on the part of a minority of the populace in early 1940 Switzerland never wavered in her determination to maintain her neutrality at any cost. This was especially the case after Henri Guisan, the elected commander-in-chief of the Swiss armed forces, rallied the Swiss to oppose the forces of any nation who would defy Swiss neutrality.

It was during the dark days of 1940-41 when certain Germans "enjoying" the neutrality of Switzerland began a rather vigorous propaganda campaign stating that the Swiss had better join up with Germany or else! A Zürich newspaper replied with the headline "Wir machen nicht mit!" - "We're not going to go

along," or in the American vernacular "We don't intend to play ball with you." This slogan became almost a watchword throughout German-speaking Switzerland and it is quite possible that it was appropriately translated into French, Italian and Romansh for Switzerland's other language groups.[2]

In any event the Swiss backed their words with actions. It is a matter of historical record that in 1939 the Swiss were completely mobilized several hours before England had declared war on Germany. Total mobilization had been accomplished in 48 hours. During the early years of World War II over 500,000 Swiss soldiers were at their posts throughout the nations. The Swiss military machine was generally regarded as a first class army.

The basis on which this first-class army was built was compulsory military service. Every Swiss boy must report at 19 for military duty. Unless excused for valid physical reasons he undergoes a three months intensive course of training. When this is terminated (in times of peace) he returns home and takes his rifle and uniform with him. Each year thereafter as long as he is on active status he must report for an annual "refresher course" for two or three weeks. Though the Swiss have few professional soldiers the whole country virtually can be mobilized in a matter of hours and be put on an armed basis and a wartime footing comparable (relatively) to that of more aggressive and war-minded nations.

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(2) Related by Anita Daniel in "The Miracle of Switzerland," American Mercury, Vol. 54, No. 221, May 1942, pp. 552-558.

In addition to rigorous basic training of all its male citizenry the Swiss have made a special feature of mountain defense. Swiss soldiers selected for this type of service were given especially severe training in mountain warfare. Special fortifications were constructed in the mountain areas. This was particularly true of an area in the Central Massif between the Simplon and the Gotthard passes. It is reported that impregnable fortifications were constructed here and it was at this point that the Swiss intended to make their real stand if an invasion took place.

Likewise by way of precaution the Swiss mined all bridges along the boundaries, as well as all airfields, dams and power stations not needed for army use. All of these could be blown up at a moment's notice. The same was true of the principle viaducts and tunnels. It was estimated that from one to five years would have been required to make the demolished tunnels usable again. Many observers feel that it was a combination of factors that kept Switzerland free from invasion during World War II but that the "trump card" was the control of the vital rail routes. Destruction of these would have been an extremely great blow to the Axis especially while Italy was still an active partner.

During the war years Switzerland was compelled by economic necessity to trade to a degree with the Axis nations. Unless Swiss industry was to be curtailed drastically and unless Switzerland was to be reduced to a near starvation diet such

varied products as iron ore, coal and other raw materials as well as some important food stuffs as wheat and other cereals had to be imported. Since any materials which the Swiss desired had to come through Axis-controlled territory the Swiss had to make reciprocal trade agreements with the Germans to the extent of allowing transit goods to flow through the Swiss controlled tunnels. Switzerland by her central position thus continued to play an especially significant role as a transit land during World War II.

The Swiss have been criticized for allowing Axis goods to pass through their country. This is a debatable issue which cannot be resolved here. Certainly for the Axis the Gotthard line was the most direct line connecting the coal and iron areas of Germany with the factory towns of northern Italy, while the Simplon Line was the most important and direct connection between the Paris Basin and Italy. Both routes were used actively by the Axis nations and quantities of strategic raw materials were transported through Swiss territory. The Swiss, however, did make a definite stipulation that no war material nor troops would be allowed through Swiss territory and the Swiss seemingly held to this rigorously. Furthermore, the Swiss themselves stated that they would supply no manufactured articles for direct military use though they did supply articles for civilian consumption such as textiles, shoes, watches. The Swiss likewise obtained navicerts from the British and traded

with Britain and the United States to the extent that war-time conditions would permit. For the most part it appears that the Swiss sincerely attempted to keep to strict neutrality and that any compromising that was done was dictated by strict necessity.

Switzerland's neutrality and central position allowed her to play a humanitarian role during the war years. Throughout World War I and World War II the Swiss worked unceasingly to help care for some of the unfortunate, innocent victims of modern warfare. Among these were the political and war refugees. (By 1944 there were over 100,000 in Switzerland). Children from belligerent countries were brought to Switzerland for recuperative sojourns. The Swiss inspected prisoner-of-war camps of all belligerents, effected exchange of prisoners, directed mail and parcels to prisoners-of-war and looked after their interests in so far as possible. The headquarters of the Red Cross is in Switzerland and this organization maintained its humanitarian work throughout both conflicts. Swiss diplomats too both in Switzerland and abroad were entrusted with the economic and diplomatic problems of most of the belligerent nations and acted as the intermediary between nations who had cut off the normal channels of diplomatic intercourse.

Switzerland's central position then, in summary, brings with it certain economic advantages as a transit land and in the possibility of commercial ties with its several neighbors. But the opposite is just as likely to be true. Swiss economy is built upon the premise of a stable and prosperous Europe.

As soon as periods of crisis or actual hostilities develop Switzerland is faced with imminent problems both of a political and economic character. It is clear then that the Swiss desire free and unhampered trade in a peaceful and stable world. Only in this way can Swiss economy function at its maximum. On the other hand should an international crisis develop the Swiss, from histocial tradition, because of their central geographical position and their numerous ties with other nations, and because of the knowledge that their very existence depends upon it, desire and strive to maintain complete neutrality at any cost. Neutrality is thus much more than a Swiss ideal. It has become the core of Swiss thinking and the heart of their very economic existence, - a political and economic necessity conditioned largely by the factor of their geographical position in the heart of western Europe.

Chapter VI

CONCLUSION

In the study of the influence of geographic factors upon the economic life of Switzerland one is impressed by the marked interaction of all the geographic factors considered. Two aspects of the problem seem to dominate, however: (1) the mountains and (2) the human factor.

In a study of Switzerland the mountains are ever in the foreground, and their importance to the country is undeniable. It is probably true, as one American geographer states, that the "mountains influence every phase of Swiss life",[1] and this is no less valid for a purely economic discussion.

In the first place it is the mountains with their glaciers, their snow-capped peaks and their lakes which give Switzerland its only important industrial resource, that of water power. While much of the actual manufacturing takes place on the plateau, the dependency of the whole country upon the vital factor of "white coal" from the mountains is very great.

Secondly the mountains and their natural beauties are the basis of the significant tourist industry which adds much to the nation's economy. While Switzerland economically is much more than the common conception of a prim little land of tourists and yodlers the importance of the tourist industry to the

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(1) Bogardus, Europe, p. 404.

Swiss cannot be discounted.

Thirdly, the mountains are the basis of much Swiss agriculture, especially the dairy phase, and of some important forestry. (This is true for the Jura and the Alpine areas alike.) It is true that much important agriculture is carried on on the plateau, but the "alps", the mountain pastures, as well as some valley bottoms contribute significantly to the overall agricultural production, while forest products are basically derived from the mountain areas.

Lastly (and more from a political point-of-view) the mountains were the birthplace of Swiss liberty and were the strongholds where freedom grew, developed and was protected. If the average Swiss citizen today is liberty-loving and independent these traits can be attributed at least in part to the mountain environment of the greater part of Switzerland.

This emphasis upon the influence of the mountains is not to deny the reality of the plateau area or of its importance. It is true that the major Swiss industrial centers, the large cities, the concentration of population, and much important agriculture are all situated on the "Mittelland". And yet in a sense the plateau is also the product of the mountains for the Swiss plain is filled with sediments which were largely derived from the denudation of the Alps and deposited on the plateau. To a degree then the plateau is a physiographic product of the Alps.

But the mountains alone would in themselves hardly suffice to explain economic life. In fact the Swiss geographic background collectively would hardly suggest wide-scale industrial development or the growth of a state the type of Switzerland. Switzerland for the most part is a stern mountain environment which man has modified by dint of his toil, his effort and his intelligence. But this adjustment to a rigorous geographic background must not be accepted as being typical. Actually Switzerland is "The most effective relationship between man and his environment to be found in any mountain area throughout the world."[2] Switzerland then must be regarded as an exceptional case. Several reasons might help account for this, but the principal explanation would seem to be found in the Swiss people themselves.

The 4,265,703 Swiss enumerated by the last census of December 1, 1941 may be divided into four ethnic groups. Approximately 72% of the total population (over 3,000,000 people) belong to the German-speaking group. Among themselves these people speak various local Alemannic dialects collectively known as Schweizerdeutsch, while literary "high" German is reserved for writing and for use on official and formal occasions. The German-speaking population is the dominant linguistic group and is concentrated in the north, east and central parts of the country. In general the Swiss-Germans show the

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(2) Bogardus, op. cit., p. 405.

stolidity, the thoroughness and capacity for painstaking detail, the seriousness of purpose and occasionally even the bluntness typical of the West Germanic peoples. In their national interests they are avowedly Swiss.

In the western part of the country French is spoken by 21% of the population. (About 884,000 people). The Swiss in this area are closer to the French in their display of greater vivacity, overt emotionalism, and light-hearted gaity and "esprit".

In the canton of Ticino 6% of the populace (around 220,000 people) speak Italian. Ticino is Italian not only in language but also in architecture and in its general aspect. It is actually a bit of Italy added to Switzerland, for historically the area once belonged to the Visconti of Milan. In the fifteenth century the canton of Uri extended its control southward down certain intermontane valleys, and over one section in particular, the Levantina. It was not until 1802, however, that Ticino was made part of the Swiss Confederation. This action was largely based on the claim stemming from Uri's original occupancy of parts of the Ticino area in the late Middle Ages. The people of Ticino resemble the Italians in stature, appearance and manner, but they are none the less Swiss in their national outlook.

A fourth ethnic group are the Romansh-speaking Rheto-Romans who comprise just a bit over 1% of the population. (About 50,000 people). These folk, believed to be direct

descendants of ancient Latin peoples, are found in some relatively isolated valleys of canton Graubünden. Recently Romansh was made the fourth national language.

Religious differences in a sense divide the people of Switzerland. Fifty-seven per cent of the people are protestant; forty-one per cent of the people are Roman Catholic; two per cent are of other faiths. Within recent history religious controversies have not been serious, though between 1500 and 1800 Switzerland had its share of religious strife.

In spite of the differences in religious outlook, differences as to language and as to ethnic groups, the Swiss for the most part work harmoniously together and think of themselves primarily and dominantly as Swiss. Swiss nationalism is not defiant or militant, but is very real none the less. It stems largely from pride in Switzerland's past and in her present high accomplishment.

Education has been a dominant factor in helping the Swiss achieve successful mastery of their difficult environment, and the people of Switzerland have done much to encourage all types of education within their country. Switzerland has free public schools, and compulsory education is required of each Swiss child to the age of 16. A large number of excellent professional schools are available for further specialized training in a wide variety of fields. Switzerland also has seven excellent universities. Three of these are in the German-speaking area (at Zürich, Basel and Berne) while three are in the French zone.

(Geneva, Lausanne and Neuchatel). The university at Fribourg is on the German-French linguistic border and instruction is given in both languages. In addition to the seven universities Switzerland also has an excellent technical institute at Zürich, the Federal Institute of Technology (Eidgenössische Technische Hochschule), a School of Engineers at Lausanne (Ecole Polytechnique de Lausanne), and a School of Economics and Business Administration at St. Gall. Education is maintained at a very high level, not for mere reasons of affectation or display, but as a real and vital aid in meeting the needs and exigencies of daily living.

Switzerland stands then as one of the most enlightened states of Europe as well as one of the most economically advanced. Switzerland's high economic standards have been won by great human effort and by the intelligent utilization of such natural geographic factors as she may possess. The land itself, the terrain, the mountains, the great natural beauties, the generally stimulating climate, the forests, the water power, the soils and attendant agriculture, all give the physical basis important for an understanding of Switzerland. But in any complete discussion a further element must be added, - that of the people themselves. It is the human factor which has controlled, directed, utilized and transformed those basic elements which nature has sparingly granted, for maximum effective use in the creation of a modern industrial state.

In the final analysis it is man working relentlessly with the geographic elements of nature who has produced what has so often been referred to as "the miracle of Switzerland".

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ABSTRACT

The purpose of the present thesis is to study the economic development of Switzerland against its geographic background. Switzerland's natural environment (its physiography, climate, soils and natural vegetation, natural resources and position) are studied in an attempt to determine to what degree these geographic factors may limit man's activities and also to what degree man himself modifies his natural environment within this given area.

Switzerland is a small buffer state situated in the mountainous heart of western Europe. Physiographically the country may be divided into three distinct areas: (1) the Jura (12%); (2) the Plateau or "Mittelland" (30%); and (3) the Alpine (58%).

Historically the mountains acted as barriers, tending to isolate the groups which dwelt within them and infusing them with a spirit of liberty and independence. Today few Swiss communities are "isolated" though many areas show marked regionalism as a result of their mountain environment.

The Alpine area with its high mountains and deep valleys has been predominantly important in the development of the Swiss tourist industry. Tourism is of economic value to the Swiss but must in no way be regarded as their most important national industry. Around 3.5% of the total Swiss population

is directly concerned with tourism. Approximately 10% of the total national income is derived from the tourist trade.

Basically Swiss climate is a mountain climate with great variations due to altitude and exposure. On the whole Swiss climate is stimulating from the human point-of-view and brings generally abundant precipitation for agricultural and industrial needs. In Ticino, where a southern type of climate is in evidence, the climatic factor is of importance in the development of this area as a tourist center. The invigorating mountain climate and rarified air of some upland areas has laid the basis for such health centers as Leysin and Davos.

Only 18% of Switzerland's total land area is arable and much of this consists of relatively poor glaciated soils requiring intensive agricultural practices. In spite of this the Swiss attempt to raise a wide diversity of crops. On the plateau grains, vegetables, fruits (orchards and vineyards) predominate. Also many dairy cattle. In the Juras, largely forestry and cattle raising. In the Alps, mainly forage crops and dairy activity though some valley bottoms can be used for fruit and vegetable production. A few especially productive spots are found where soils are richer and climate milder, e.g. in the Valais and along Lake Geneva between Lausanne and Montreaux. Here the production of fruits and quality vegetables predominates.

Transhumance, the migratory pasturing of cattle on the "alps" or Alpine meadows, is a special but interesting aspect of Swiss agricultural practices.

The Swiss process some foods (especially dairy products) for the export market.

Switzerland has little mineral wealth. Her only mineral resource of value is water power which has been developed to a very great degree. In spite of the poorness of her mineral resources Switzerland has become an outstanding industrial nation. (45% of population engaged directly in industry.) This has been accomplished by selling products of high value per unit bulk. Swiss products such as watches, precision instruments, fine textiles, pharmaceuticals are the result of skillful and painstaking work. The Swiss basically sell their abilities.

Switzerland's central position is of vital importance in shaping Swiss international relations. Historically Switzerland was important as a transit land. Since the building of the Gotthard and Simplon tunnels Switzerland's central position has become of even greater economic importance. The most direct rail routes to Italy and the Balkans from northern and western Europe lead through Switzerland and give her the economic advantages of much transit trade.

Switzerland's central position, however, becomes precarious when her stronger neighbors become involved in armed conflict. The Swiss attempt to maintain strict neutrality, de-

fending their homeland with a well-trained citizens' army. Control of the strategic passes and tunnels may have been a "trump card" in helping to avoid invasion in World War II. The Swiss sincerely desire neutrality for their very economic existence is dependent upon it.

In Switzerland all the geographic factors considered interact to produce a highly developed industrial state. The mountains and the human factor are of special importance.

The mountains are the basis of the water power, the tourist industry and of much significant agriculture. The mountains dominate Swiss life.

Switzerland must not be regarded as typical of man's adjustment to a rigorous mountain environment. It is the Swiss people who in spite of linguistic, ethnic and religious differences have struggled to develop one of the most enlightened states of Europe. Education has been of paramount importance.

The Swiss economic state is the result of enlightened adaptation and maximum effective utilization of such natural geographic factors that she may possess. Man working relentlessly with nature has produced the miracle of Switzerland.

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